B3: Annotated list of useful interoperability frameworks and guidance

- Who is this tool for? Health and other social protection practitioners considering their approach interoperability as part of a population targeting data linkage initiative.
- How was it produced? Detailed discussions on interoperability standards were not held as part of the JLN Learning Collaborative on Population Targeting's learning workshops. However, it was felt that this was an important topic to include some guidance on for practitioners at this particular point in their data linkage. Therefore, literature and subject matter experts were consulted to compile the following list of key guidance and best practice.

Data interoperability frameworks are an important element in promoting data sharing across public agencies. A leading global example, the European Interoperability Framework, outlines four interoperability layers that need to be defined:

1. **Legal interoperability**—Legal, policy, and regulatory frameworks define the scope of interoperability, particularly with regard to data exchange and requirements for privacy and data protection.
2. **Organizational interoperability**—For interorganizational interoperability, federation, or mutual recognition of ID systems, organizations must define trust frameworks and process standards around the identity lifecycle (e.g., the eIDAS standards).
3. **Semantic interoperability**—To ensure that the meaning of exchanged data and information is consistent, systems must adopt the same data standards or construct data dictionaries.
4. **Technical interoperability**—To enable machine-to-machine communication, systems must adopt the same technology standards for software, physical hardware components, and systems and platforms.

Throughout these four layers, interoperability frameworks also rely on **integrated public service governance** to ensure usability, security, privacy, and performance. The World Bank Identification for Development program provides an overview of key requirements for defining each layer of an interoperability framework (https://id4d.worldbank.org/guide/interoperability-frameworks).

Requirements for building interoperability frameworks (World Bank)

Layer	Requirements
Legal	Perform "interoperability checks" by screening existing legislation to identify: **Interoperability barriers:** Sectoral or geographical restrictions in the use and storage of data, different and vague data license models, over-restrictive obligations to use specific digital technologies or delivery modes to provide public services, contradictory requirements for the same or similar business processes, outdated security and data protection needs, etc. **Coherence:** Evaluate compatibility between the enabling legislation of different organizations in order to ensure interoperability **Digital applicability:** Ensure that legislation suits digital (as well as physical) identity data processing
Organizational	Define inter-organizational relationships and processes: Organizations must **align their business processes**, **responsibilities** and **expectations** to achieve commonly agreed and mutually beneficial goals and document them. Cleary **define relationship** between service providers and service consumers e.g. MoU's, Service Level Agreements (SLAs), API specifications, etc.
Semantic	Adopt data standards to be used by organizations in the interoperability framework: Develop **semantic vocabularies** and schemata to describe data exchanges, and ensure that data elements are understood in the same way by all communicating parties (e.g., via XML and JSON languages, and use of metadata) Define **syntactic format** of the information to be exchanged in terms of grammar and format.

Technical	Adopt technical standards to be used for system components and devices: Use **open specifications**, where available, to ensure technical interoperability Put in place **processes to select relevant standards and specifications**, evaluate them, monitor their implementation, check compliance and test their interoperability. Use a **structured, transparent, objective and common approach** to assessing and selecting standards and specifications, considering the requirement to make them consistent across borders Consult **relevant catalogues of standards**, specifications and guidelines at national and regional level, when procuring and developing ICT solutions
Integrated public service governance	Throughout the above layers, ensure coordination and documentation of: The definition of **organizational structures, roles and responsibilities** and the decision-making process for the stakeholders The imposition of requirements for aspects of **interoperability** including quality, scalability, availability, service level agreements, security and privacy controls **Change management plans** that define the procedures and processes needed to deal with and control changes **Business continuity/disaster recovery plans** to ensure that digital public services and their building blocks continue to work in a range of situations (e.g. cyberattacks or systems failures)

Examples of interoperability frameworks:

Brazil: In 2018, the Brazilian government launched the **Conecta.gov platform** (www.conecta.gov.br) to promote interoperability throughout the public sector. Conecta.gov.br is an interoperability platform which includes a catalogue of APIs that can be used to integrate public services and exchange information across government agencies. Agencies connect their own systems through the APIs to share data as users and providers. *For more information, see OECD (2018), Digital Government Review of Brazil: Towards the Digital Transformation of the Public Sector, https://doi.org/10.1787/9789264307636-en*.

EU Interoperability Framework: https://ec.europa.eu/isa2/eif_en. The European interoperability framework defines basic interoperability guidelines in the form of common principles, models and recommendations for EU member states developing their own interoperability frameworks. It covers data interactions between public agencies, between public agencies and businesses and between public agencies and citizens. Its four layers of interoperability are outlined in the table above.

For more details, see: (1) EU Interoperability Framework PPT; (ii) EU Interoperability Framework Brochure.

France. Référentiel Général d'Interopérabilité (RGI). RGI is the French national interoperability framework, which is closely based on the EU framework. Like the EU framework, it covers all interactions among public agencies and between public agencies and both firms and citizens. It includes recommended and mandatory norms, standards and best practices. It covers semantic, syntactical and technical levels of interoperability for those with technical responsibilities in public administration.

For more details, see: (i) NIFO Factsheet – France. 2016. (ii) Référentiel Général d'Interopérabilité: Standardiser, s'aligner et se focaliser pour échanger efficacement. 2015 (in French).

Mauritius. InfoHighway platform, a government data exchange layer that customized and adapted Estonia's X-Road model and helped connect basic registries—supported by Estonia's eGovernance Academy. Provide Government of Mauritius with a single platform offering scalable e-services. InfoHighway is administered by the Ministry of Technology, Communication, and Innovation. InfoHighway uses a "Publish and Subscribe Model" for intragovernmental data sharing, whereby the agency sharing data is the "Publisher" and the one requesting the data is the "Subscriber."

For details, see the Mauritius country case study in "Unravelling Data's Gordian Know: Enablers and Safeguards for Trusted Data Sharing in the New Economy". Digital Development Partnership. World Bank, 2020 (pp. 86-93). This is a useful reference in general on the issues, and includes multiple country case studies.

Moldova Interoperability Framework. The Moldova Framework adheres to the general approach of the EU framework. It was initiated in 2012 by Government Decision which provide guiding principles and a roadmap for development, piloting and roll-out of the IOF. It took final form under a 2018 Law and a 2019 Government Decision on the interoperability framework and platform, now called MConnect. The purpose of the interoperability platform is to facilitate but also to streamline data exchange and interoperability within the public sector, as well as between the public and private sectors, in order to increase the quality of public services provided, create new electronic public services and ensure information security. The Electronic Governance Agency is responsible for ensuring the legal, semantic, organizational and technical interoperability.

For more details, see: (i) 2012 and 2019 Government decisions and 2018 Law on interoperability framework; and (ii) https://mconnect.gov.md.

Uruguay interoperability framework. Uruguay has made great progress in its interoperability framework, which is built on open standards which allow universal use of the platform, independent from proprietary protocols. The infrastructure was established in 2008 but only widely used from 2016 due to variable starting points across agencies and time needed to build trust across all of government. The platform involves decentralized data management by each operational agency and a centralized interoperability platform for data exchange based on common standard. The platform has two layers: (i) Interoperability layer (semantic and technical). Semantic interoperability uses common metadata definitions made in agreement with all agencies involved in use of information. Technical interoperability is implemented with an Enterprise Service Bus (ESB) accompanied by a set of definitions based on open standards. The security layer covers physical security and logical security.

For details, see: (1) The Uruguayan Digital Data Journey. Maria Mendaro, 2020.

(2) Uruguay case study in Unravelling Data's Gordian Knot: Enablers and Safeguards for Trusted Data Sharing in the New Economy. Digital Development Partnership. World Bank, 2020 (pp.94-100).

International Social Security Association Guidelines (ISSA) Guidelines on Information and Communication Technology 2019 also have lots of useful practical guidance on all aspects of interoperability. The guidelines cover key dimensions of interoperability: political, legal, organizational, semantic and technical, identifying the services to be connected, related business processes, information structure & data exchanged. Some of the key guidelines are:

Guideline 28. Institutional interoperability framework
Guideline 29. Workplan for the implementation of interoperability-based social security programs
Guideline 30. Institutional interoperability application model
Guideline 31. E-government services
Guideline 32. Institutional semantic interoperability
Guideline 33. Interoperable shared data services
Guideline 34. Data exchange
Guideline 35. Institutional technical standards on interoperability.

The Guidelines are available at *https://ww1.issa.int/guidelines/ict/174551* (needs institutional or personal login and password, but most public agencies should have access to one of these)